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Comparison of anthropometric indices (body mass index, waist circumference, waist to hip ratio and waist to height ratio) in predicting risk of type II diabetes in the population of Yazd, Iran

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ABSTRACT

Background and objectives: The purpose of this study was to determine the best anthropometric index and calculate the cut-off point for each anthropometric index in predicting the risk of type II diabetes in the population of Yazd city in Iran.

Materials and methods: The present analytical cross-sectional study was performed using the data from Yazd Health Study (YaHS) with a sample size of 9293. All required data including anthropometric indices BMI, WC, WHR, and WHtR were extracted from the YAHS questionnaire. The ROC curve was employed to compare the predictive power of each anthropometric index in the risk of developing the type II diabetes.

Results: WHtR in both genders had better predictive power for the risk of type II diabetes (AUC=0.692 for males and AUC = 0.708 for females), and BMI showed a weaker predictive power (AUC=0.603 for males and AUC = 0.632 for females), WC and WHR also revealed similar predictive power in the risk of type II diabetes. The cut-off point of BMI for predicting the risk of diabetes was almost identical in both genders (26.2 in males and 25.9 in females), the cut-off point of WC (91 cm), and WHtR (0.56) in males was lower than in the females (96 cm for WC and 0.605 for WHtR). The cut-off point of WHR in males (0.939) was higher than in females (0.892).

Conclusion: The WHtR showed the best predictor of diabetes risk compared to other indices, and the BMI was the weakest predictor of the risk for diabetes.

Keywords: Type 2 diabetes; Body mass index; Waist circumference; Waist to hip ratio; Waist to height ratio.

INTRODUCTION

Over one billion people worldwide are facing overweight and obesity. It is well-documented that epidemics of overweight and obesity are one of the most important public health problems in developed and developing countries [1]. The prevalence of obesity and overweight in Middle Eastern countries in males and females is respectively estimated to be 54.2% and 31.4%, according to the World Health Organization (WHO). Annually,

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